

Annex K Reclamation District 800

K.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Reclamation District 800 (RD 800), a previously participating jurisdiction to the Sacramento County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the RD 800. This Annex provides additional information specific to RD 800, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this District.

K.2 Planning Process

As described above, the District followed the planning process detailed in Section 3 of the Base Plan. In addition to providing representation on the Sacramento County Hazard Mitigation Planning Committee (HMPC), RD 800 formulated its own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table K-1. Additional details on plan participation and RD 800 representatives are included in Appendix A.

Table K-1 RD 800 Planning Team

Name	Position/Title	How Participated
Robert C. Wagner, P.E.	District Engineer	Reviewed Draft Documents
Patrick W. Ervin, P.E.	Engineer	Attended Meetings, Drafted Text
Martin Berber	Staff Engineer	Reviewed Draft Documents, Collected Data

Source: RD 800

K.2.1. Coordination with Other District Planning Efforts

Coordination with other District planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the District integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, RD 800 incorporated into or implemented the 2011 LHMP through other plans and programs shown in Table K-2.

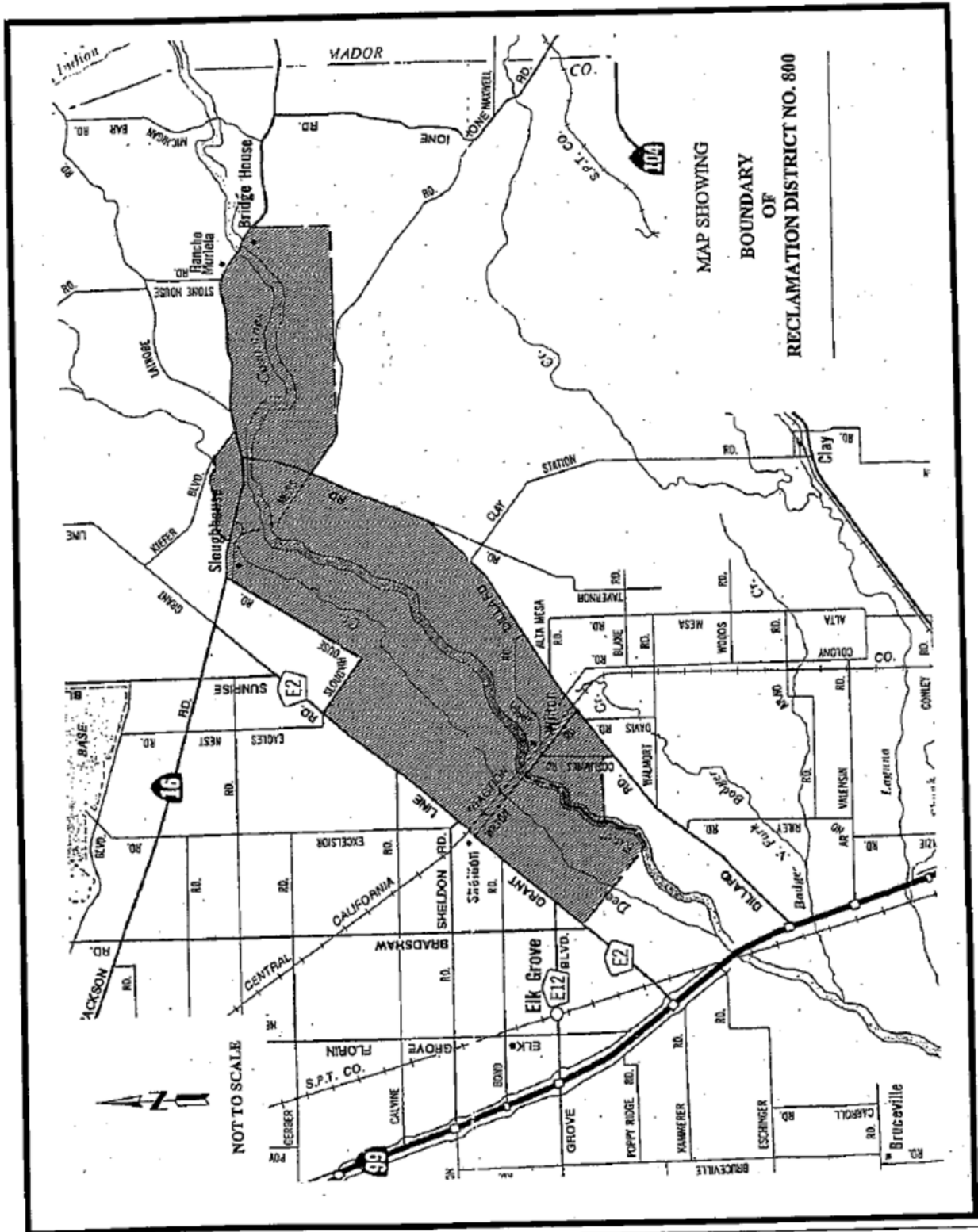
Table K-2 2011 LHMP Incorporation

Planning Mechanism 2011 LHMP Was Incorporated/Implemented In.	Details?
Erosion Repair Implemented	The District has repaired 4 places along the Consumnes River that had significant erosion issues between levee stations 100+00 and 404+50.

K.3 Community Profile

The community profile for RD 800 is detailed in the following sections. Figure K-1 displays a map and the location of RD 800 boundaries within Sacramento County.

Figure K-1 Reclamation District 800 Map



Source: RD 800

K.3.1. RD 800 Overview, Background, and History

Reclamation District No. 800 is an area within Sacramento County lying along the Cosumnes River and was originally created by action of the California State Legislature in 1907 (Statutes 1907,Ch 213). This original District, comprised of 2,136 acres, is located between Deer Creek and the Cosumnes River east of Elk Grove in Sacramento County. In January 1997, a flood of extraordinary size occurred on the Cosumnes River between Sloughhouse and Wilton requiring considerable construction work to levees along the river. However, no levee breaks occurred on those maintained by Reclamation District 800.

As a result of the 1997 flood on the Cosumnes River, it became apparent that a public agency was needed to maintain the levees and facilities along the river between Sloughhouse and Wilton areas, outside the boundaries of Reclamation District 800. At the request of landowners along the Cosumnes River whose lands were not included within Reclamation District 800, the Trustees of the District sought an amendment to the act under which the District was formed, in order to modify the boundaries and incorporate additional lands on the right bank of the Cosumnes River and to include, for the first time, lands on the left bank of the river down to the vicinity of Wilton.

To accommodate the above additions of land, SB 437 (Senator Patrick Johnston) was introduced and adopted by the Legislature and signed by the Governor as Chapter 191, Statutes of 1997. This action provided for the increase in District acreage from 2,136 to 25,435 acres. The total potential levee length is 34.05 miles with 17.65 miles along the right (or north) bank and 16.40 miles along the left (or south) bank.

Since the 1997 flood, with assistance from the County of Sacramento and funding by the U.S. Department of Agriculture, repairs were completed to levees along the Cosumnes River.

K.4 Hazard Identification

RD 800's planning team identified the hazards that affect the District and summarized their geographic extent, probability of future occurrences, potential magnitude/severity, and significance specific to RD 800 (see Table K-3).

Table K-3 RD 800—Hazard Identification

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Agricultural Hazards				
Bird Strike				
Climate Change				
Dam Failure				
Drought and Water Shortage				
Earthquake				
Earthquake: Liquefaction				
Flood: 100/200/500-year	Extensive	Occasional	Catastrophic	High
Flood: Localized Stormwater Flooding				
Landslides				
Levee Failure	Extensive	Occasional	Catastrophic	High
River/Stream/Creek Bank Erosion	Significant	Highly Likely	Catastrophic	High
Severe Weather: Extreme Temperatures – Cold/Freeze				
Severe Weather: Extreme Temperatures – Heat				
Severe Weather: Fog				
Severe Weather: Heavy Rains and Storms (Thunderstorms, Hail, and Lightning)	Significant	Likely	Critical	Medium
Severe Weather: Wind and Tornadoes				
Subsidence				
Volcano				
Wildfire:(Burn Area/Smoke)				
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.		Magnitude/Severity Catastrophic —More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical —25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited —10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible —Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact		

K.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile RD 800’s hazards and assess the District’s vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 and 4.3 Vulnerability Assessment in the main plan. The hazard profiles in the main plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to RD 800 is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the main plan.

K.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section K.5.3, includes a description as to how the hazard affects the RD 800 and information on past occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

K.5.2. Vulnerability Assessment

This section identifies RD 800’s assets at risk, including values at risk, critical facilities and infrastructure, economic assets, natural resources, historic and cultural resources, and growth and development trends.

Assets at Risk and Critical Facilities

This section considers the District’s assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this plan:

Any facility (a structure, infrastructure, equipment or service), that is adversely affected during a hazardous event may result in interruption of services and operations for the District at any time before, during and after the hazard event. A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, and (3) Hazardous Materials Facilities.

Table K-4 lists particular critical facilities and other District assets identified by the RD 800’s planning team as important to protect in the event of a disaster. RD 800’s physical assets, valued at over \$100 million, consist of the buildings and infrastructure to support the RD 800 operations.

Table K-4 RD 800’s Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
RD 800 levees	Levee		In excess of \$100,000,000	Flood

Source: RD 800

Natural Resources

The Planning Team for the District noted no natural resources.

Historic and Cultural Resources

The Planning Team for the District noted no historic or cultural resources.

Growth and Development Trends

Growth and development within RD 800 has remained relatively unchanged since 2011. The District is composed of rural farmland with few economic drivers.

Development since the 2011 Plan

The RD has not seen an increase in their service area population since the 2011 plan. There is currently a project in the planning/permitting phase that will fix a large erosion area adjacent to Rooney Dam the Cosumnes River.

K.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table K-3 as high or medium significance hazards. Impacts of past events and vulnerability of the RD 800 to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Sacramento County Planning Area). Methodologies for calculating loss estimates are the similar to those described in Section 4.3 of the Base Plan and are based on data provided by the District as described further below. In general, the most vulnerable structures are those located within the floodplain or within levee and dam inundation areas, such as older facilities that may be constructed with unreinforced masonry and buildings built prior to the introduction of modern building codes. Buildings that contain electronic or electrically operated equipment are also vulnerable to flood inundation.

In general, the most vulnerable District assets include the levees and supporting structures that the District owns.

An estimate of the vulnerability of the RD 800 to each identified priority hazard, in addition to the estimate of probability of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.

- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Flood: 100/200/500-year

Likelihood of Future Occurrence—Occasional

Vulnerability—High

Hazard Profile and Problem Description

Flooding would occur as a result of levee failure or overtopping.

Past Occurrences

The District Planning Team noted that multiple levee failures occurred on the Cosumnes in 1997 which led to flooding.

Vulnerability to Flood

Assets at Risk

Flooding would occur as a result of levee failure or overtopping. Levee failure from either breaching or overtopping would result in the total loss of levee embankment material, as was the case in the 1997 flood event. Levee embankment failure within the current District boundary from the 1997 event resulted in multiple levee failure sites along the Cosumnes River. The resulting damage to agricultural lands was extensive, with the most damage occurring immediately adjacent to the levee breach causing severe erosion to agricultural lands, deposition of sands and debris and the complete destruction of adjacent vineyards and irrigation systems.

Future Development

While future development may occur in the areas protected by levee, the District does not control this development. The District only can control whether the levees meet certification standards. The District Planning Team did note, that future development is unlikely.

Levee Failure

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

Floods can threaten the District from several sources including levee failure. Usually, the possibility of flooding can be anticipated from eight to twenty hours before the “Emergency Period” is reached. However, as demonstrated in Linda, California, in February 1986, it is possible for a levee to collapse with little or no warning when there are still four or more feet of freeboard available.

Generally, levees fail due to overtopping or collapse. A catastrophic levee failure resulting from collapse probably will occur very quickly with relatively little warning. Such a failure would occur where the levee is saturated and the high hydrostatic water pressure on the river side, coupled with erosion of the levee from high water flows or an inherent defect in the levee, causes an almost instant collapse of a portion of the levee. Under such circumstances, structures located relatively near the break will suffer immediate and extensive damage. Several hundred yards away from the break the energy of the flood waters will be dispersed sufficiently to reduce, but not eliminate, flooding damage to structures in its path. The flood water will flow in a relatively shallow path toward any low point in the affected area. Flood water will collect in these low areas and the levels will rise as the flow continues. When the rivers are high, it is not possible to close or repair a levee break until the water surface in the river and the flooded area equalize.

A major overtopping of a levee, if flow persists, will result in severe erosion of the levee crowns on the landward side and cause levee failure over a period of minutes to several hours. A severe levee overtopping can, therefore, be considered as a levee break for the purpose of determining the extent of flooding that any area will suffer. Generally, overtopping can be predicted based on river stages and the warning given depending on the source of the flood waters

Past Occurrences

The Planning Team for the District noted multiple levee failures in 1997 which led to flooding.

Vulnerability to Levee Failure

Assets at Risk

Potential for severe damage to the Wilton Road crossing over the Cosumnes River would require detouring of extensive daily high volume traffic of Wilton Road. Closure of the road would severely delay public safety agency emergency response. Truck and vehicular traffic impacts would have severe economic impacts to the local economy.

Future Development

While future development may occur in the areas protected by levee, the District does not control this development. The District only can control whether the levees meet certification standards. The District Planning Team did note, that future development is unlikely.

River/Stream/Creek Bank Erosion

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Stream bank erosion is a natural process, but acceleration of this natural process leads to a disproportionate sediment supply, stream channel instability, land loss, habitat loss and other adverse effects. As farmers settled the valleys in the 1800s, the Gold Rush drew prospectors to the hills. As mining in the Sierra Nevada turned to the more “efficient” methods of hydraulic mining, the use of environmentally destructive high-pressure water jets washed entire mountainsides into local streams and rivers. As a result, the enormous amounts of silt deposited in the riverbeds of the Central Valley increased flood risk. As a remedy to these rising riverbeds, levees were built very close to the river channels to keep water velocity high and thereby scour away the sediment. However, the design of these narrow channels has been too successful. While the Gold Rush silt is long gone, the erosive force of the constrained river continues to eat away at the levee system and stream banks within the District.

Past Occurrences

The District Planning Team noted that bank erosion is an ongoing problem, but noted no major past occurrences.

Vulnerability to Erosion

Assets at Risk

The waterside levee slope of the Cosumnes River is heavily vegetated and considered to be high value habitat with an abundance of endangered species. Consequently, the vulnerability to stream bank erosion is high, the cost to mitigate for habitat loss prevents the District from repairing existing eroded areas.

Future Development

While future development may occur in the areas protected by levees that may be affected by erosion, the District does not control this development. The District only can control whether the levees meet certification standards. The District Planning Team did note, that future development is unlikely.

Severe Weather: Heavy Rain and Storms

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to historical hazard data, severe weather is an annual occurrence in the District. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future.

Past Occurrences

The District Planning team noted that 1997 storms caused high flows in the Consumnes which cause levee failures and flooding.

Vulnerability to Heavy Rain and Storms

Assets at Risk

Heavy rain and thunderstorms are the most frequent type of severe weather occurrence in the area. Wind and lightning often accompany these storms and have caused damage in the past. Problems associated with the primary effects of severe weather include flooding, pavement deterioration, washouts, high water crossings, landslide/mudslides, debris flows, and downed trees. However, it is the secondary effects of heavy rain and storms that are of concern to RD 800. Heavy rains can cause flooding, levee failure, and stream bank erosion. Flooding, levee failure, and stream bank erosion can cost RD 800 millions in damages.

Future Development

While future development may occur in the areas protected by levee, the District does not control this development. The District only can control whether the levees meet certification standards and can withstand heavy rains and storms. The District Planning Team did note, that future development is unlikely.

K.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

K.6.1. Regulatory Mitigation Capabilities

Table K-5 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the RD 800.

Table K-5 RD 800's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	N	
Capital Improvements Plan	N	
Economic Development Plan	N	
Local Emergency Operations Plan	N	
Continuity of Operations Plan	N	
Transportation Plan	N	
Stormwater Management Plan/Program	N	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	N	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	5-Year Plan California DWR Emergency Safety Plan
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	N	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	N	Rating:
Site plan review requirements	N	
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	N	
Subdivision ordinance	N	
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Encroachment permit regulations
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	Y	Erosion control measures on levee and canal slopes as necessary
Other		
How can these capabilities be expanded and improved to reduce risk?		

Source: RD 800

K.6.2. Administrative/Technical Mitigation Capabilities

Table K-6 identifies the department(s) responsible for activities related to mitigation and loss prevention for RD 800.

Table K-6 RD 800's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	N	
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	N	
Emergency Manager	N	
Community Planner	N	
Civil Engineer	Y	
GIS Coordinator	N	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N	
Hazard data and information	N	
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Source: RD 800

K.6.3. Fiscal Mitigation Capabilities

Table K-7 identifies financial tools or resources that the RD 800 could potentially use to help fund mitigation activities.

Table K-7 RD 800's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds	N	
Incur debt through private activities	N	
Community Development Block Grant	Y	
Other federal funding programs		
State funding programs		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Source: RD 800

K.6.4. Mitigation Education, Outreach, and Partnerships

Table K-8 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table K-8 RD 800's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	N	
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Other		
How can these capabilities be expanded and improved to reduce risk?		

K.6.5. Other Mitigation Efforts

Levee maintenance practices designed to protect District levee system includes annual vegetation management and rodent control. Due to environmental protection limitations, District disaster reduction practices are limited.

K.7 Mitigation Strategy

K.7.1. Mitigation Goals and Objectives

RD 800 adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

K.7.2. Mitigation Actions

The planning team for RD 800 identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

Action 1. Erosion Repair

Hazards Addressed: Bank Erosion / Flooding

Goals Addressed: 1, 2, 3, 4

Issue/Background: Because RD 800 is outside of the legal Delta, it does not qualify for many State programs designed to fund the maintenance and repair District levees. Thus, there are many erosion sites on RD 800 that lack funds for repair.

Other Alternatives: None

Existing Planning Mechanisms through which Action will be Implemented: The District will rely on its Engineer to locate erosion sites and prioritize them by severity. Available funds will be used to repair the most severe erosion areas first. Depending on the size of the erosion site, regulatory permits may be

required by agencies such as the California Department of Fish and Wildlife and the U.S. Army Corps of Engineers.

Responsible Office: RD 800, RD Engineer

Priority (H, M, L): H

Cost Estimate: \$1,000,000

Potential Funding: None

Benefits (avoided Losses): Homes, Agricultural Crops

Schedule: Ongoing

Action 2. Emergency Supplies

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 4

Issue/Background: Due to lack of funds, the District has minimal flood fight supplies on-hand. The California Department of Water Resources recommends the following items for flood fighting per 5 to 6 miles of levee:

- visquine plastic 10 rolls (@100'x20'x10mil)
- sandbags 5,000
- twine @ 200 lb. Test 8 boxes
- wooden stakes 200
- tie buttons 1,000

Tools needed:

- Lineman pliers 8 each
- sledge hammers 8 each
- shovels 10 each
- life jackets All personnel

In addition to flood fight supplies, the District also needs flood fight materials such as 18"-minus rock stockpiles to help prevent levee breaches and aggregate base rock to repair levee roads as they are damaged during a flood fight.

Other Alternatives: None

Existing Planning Mechanisms through which Action will be Implemented: Board of Trustees would purchase and stockpile supplies in strategic locations throughout the District.

Responsible Office: RD 800, RD Engineer

Priority (H, M, L): H

Cost Estimate: \$500,000

Potential Funding: None

Benefits (avoided Losses): Homes, Agricultural Crops

Schedule: Ongoing